

REMARKS

Claims 10-11, 15, 25-26, 30-58, 62, and 66-80 are now pending in the application. Claims 1-9, 12-14, 16-24, 27-29, 59-61, and 63-65 have been canceled without prejudice or disclaimer. The specification, drawings, and claims 10, 15, 25, 30, 31, 34, 41, 62, and 66 have been amended, and new claims 77-80 added, without introduction of new matter. Favorable reconsideration is respectfully requested in view of the above amendments and the following remarks.

The indication that claims 10, 11, 25, 26, 33, 34, 43, 48, 51, 53-55, 57-58, 62, 66, 69, and 72 define allowable subject matter is noted with appreciation. In response, claims 10, 25, 62, and 66 have been rewritten in independent form including all of the limitations of the base claim and any intervening claims. Therefore, claims 10, 25, 62, and 66, as well as the claims 11 and 26 which depend from respective claims 10 and 25, are now believed to be in allowable form.

Independent claims 31 and 41 have each been amended so that their last paragraphs read “combining the associated frequency error integrals to produce at least one relative frequency error estimate.” These amendments are supported in the specification at, for example, Fig. 8A (see, e.g., output of integrator 301-1 going to combiner 402 whose function is to “combine all per-ray frequency corrections from 301-1 to 301-n”) and supporting specification text. Each of claims 31 and 41 has been further amended to now recite “correcting frequency errors on each of the despread value streams by, for each of the despread value streams, progressively rotating the phase angle of successive despread values at a rate given by an associated frequency error integral.” This latter amendment is intended merely to even further clarify that the “associated frequency error integral” is “associated” with the particular one of the “dspread value streams.” Since the claim had already defined “correcting frequency errors on each of the despread value streams by ... progressively rotating ... at a rate given by an associated frequency error integral”, this amendment is not believed to be a narrowing one.

The Abstract was objected to because it exceeded 150 words. In response, a new Abstract is presented herewith that addresses the concerns expressed in the Office Action. No new matter has been added. Withdrawal of the objection is respectfully requested.

The drawings were objected to as allegedly failing to comply with 37 CFR 1.84(p)(5) for including reference signs not mentioned in the description. These objections are addressed in the following:

Regarding Fig. 3, the Office objected that reference numerals 10 and 20 are not mentioned in the description. In response, Fig. 3 is now amended to remove reference numerals 10 and 20.

Regarding Fig. 5, the Office objected that reference numerals 10, 11, 12, 13, 14, 20, and 21 are not mentioned in the description. In response, the Office's attention is directed to the specification at page 3, lines 3-11, where the elements bearing reference numerals 10, 11, 12, 13, and 14 are mentioned with reference to Fig. 1B. The Office's attention is further directed to page 8, lines 10-11, which reads: "... drawings, in which like reference numerals refer to like elements" Thus, because they are mentioned with reference to Fig. 1B, it is unnecessary to repeat the description of these elements with reference to Fig. 5. As to the remaining reference numerals 20 and 21, these are now expressly mentioned in the specification as a result of an amendment made at page 6, line 10, without introduction of new matter.

Regarding Fig. 6, the Office objected that reference numerals 100, 110, 120, 130, 140, 150, 160, 170, and 180 are not mentioned in the description. In response, Fig. 6 is now amended to remove these reference numerals.

Regarding Fig. 7, the Office objected that reference numerals 10, 11, 12, 13, 14, 15, 16, 17, 18, and 19 are not mentioned in the description. In response, the Office's attention is directed to the specification at page 3, lines 3-14, where the elements bearing reference numerals 10, 11, 12, 13, 14, 15 are mentioned with reference to Fig. 1B (please recall that "like reference numerals refer to like elements"). Reference numerals 16 and 17 are mentioned at page 15, lines 17-19; and reference numeral 19 is mentioned at page 13, lines 1-2 with reference to Fig. 7. As to the remaining reference numeral 18, this is now expressly mentioned in the specification as a result of an amendment made at page 6, line 23, without introduction of new matter.

Regarding Fig. 10, the Office objected that reference numerals 503a, 503b, and 503c are not mentioned in the description. In response, Fig. 5 has been amended to remove these reference numerals.

Regarding Fig. 11, the Office objected that reference characters 19 and 12-1 – 12-n are not mentioned in the description. In response, the Office's attention is directed to the specification at page 13, lines 1-2, where elements bearing reference numeral 19 are mentioned (please recall that "like reference numerals refer to like elements"). Reference characters 12-1 – 12-n are mentioned at page 9, line 32.

Regarding Figs. 12 and 13, the Office objected that reference characters 12-1 – 12-n are not mentioned in the description. In response, the Office's attention is directed to the specification at page 9, line 32, where elements bearing reference characters 12-1 – 12-n are mentioned.

Regarding Fig. 15A, the Office objected that reference characters "570a1 – 570a-n" [sic] are not mentioned in the description. In response, it is noted that no such reference characters appear in Fig. 15A, nor can Applicants find it in any other figure in the application. Applicants speculate that the Office intended to refer to reference characters 507a1 – 507a-n, which appear in Fig. 13, and have amended the specification at page 17, line 23 (without introduction of new matter), to specifically mention these reference characters.

Also regarding Fig. 15A, the Office objected that reference characters 503a, 503b, 503c, 501, 502, 504-1 – 504-2, and 508 are not mentioned in the description. In response, reference characters 503a, 503b, 503c, and 508 have been removed from Fig. 15A. The Office's attention is directed to the specification at page 14, lines 7 and 10, where reference numerals 501 and 502 are respectively mentioned. Also, the specification has been amended (without introduction of new matter) at page 19, line 26 to expressly mention reference characters 504-1 – 504-2.

The drawings were further objected to for allegedly not including the following reference signs mentioned in the description: reference characters 503b-1 – 503b-4, 503n-2 – 503n-4 in Fig. 10, and reference character 508-1 in Fig. 15A.

In response, Fig. 10 has been amended, without introduction of new matter, to expressly include the elements referred to by reference characters 503b-1 – 503b-4, 503n-2 – 503n-4, and of course to include these reference characters themselves.

As to Fig. 15A, it is respectfully noted that the figure already includes reference character 508-1; it may be found in the box labeled "AFC LOOP INTEGRATOR FOR BASE STATION-1 FREQUENCY ERROR", in the upper right-hand corner of the figure. Accordingly, no further modification to the figure is necessary.

For at least the remarks and amendments set forth above, the drawings are believed to satisfy all of the requirements of 37 CFR 1.84(p)(5). Therefore, it is respectfully requested that the objection to the drawings be withdrawn.

Claims 1 and 34 were objected to because of several informalities. The objection to claim 1 has been rendered moot by the cancellation of this claim. However, the Office's concerns have been taken into account in re-writing some of the claims into independent form. Claim 34 has been amended to address the concern expressed in the Office Action. Accordingly, it is respectfully requested that the objection to the claims be withdrawn.

Claims 1-9, 12-15, 16-24, 27-30, and 73-76 were rejected under 35 U.S.C. §102(b) as allegedly being anticipated by Easton (USP 5,764,687). This rejection is respectfully traversed.

Claims 1-9, 12-14, 16-24, and 27-29 have been canceled, thereby rendering this rejection moot as to these claims.

Claims 15 and 30 have been rewritten in independent form, incorporating all features of their respective base claims and intervening claims.

It is well established that “[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). In the present instance, the Easton patent fails to anticipate any of independent claims 15, 30, 73 or 76 because it neither discloses nor suggests estimating a frequency error separately for each transmitter whose signal is received. In claims 15, this feature is recited as “the at least one summer produces at least one relative frequency error estimate separately for each base station.” In claim 30, this is recited as “wherein frequency error estimates are computed separately for each base station.” In claim 73, this feature is recited as “frequency error estimators for estimating frequency errors separately for each transmitter.” And, in independent claim 75, this feature is recited as “estimating frequency errors separately for each transmitter.”

In column 3, lines 55-58, Easton indicates that the RAKE receiver provides path diversity in combining path signals having fingers associated with them. Easton mentions soft handoff and the establishment of links between the receiver and two or more base stations. Even if one were to argue from this and Figure 2 that there is an inference that the fingers in Figure 2 could be assigned to different base stations, in Figure 2 only one

frequency error estimate is produced by combining estimates from the different fingers. This would imply that the receiver is computing an average frequency error, averaged over the different base stations – not separate estimates for each base station. Note that in column 11, lines 13-25 of Easton, there is only a notion of one base station (see “the base station” on line 20).

By contrast, the invention defined by claims 15, 30, 73 and 75 computes separate frequency error estimates for each base station.

The Office relies on Easton at column 4, lines 59-65 and element 26 of Easton's Figure 2 for support of its rejection of claims 15 and 30. This reliance is unfounded because in column 4, lines 59-65, Easton points out that each base station transmitter has a unique PN offset and transmits its own pilot channel. It does not describe anything at the receiver. There is no notion of each base station having a different frequency offset nor of a receiver estimating such offsets. Element 26 of Fig. 2 actually leads to the opposite conclusion because, as described above, it implies that frequency error estimates per finger are combined to give one average estimate.

For at least the foregoing reasons, independent claims 15, 30, 73, and 75, as well as claims 74 and 76 which depend respectively from claims 73 and 75, are believed to be patentably distinguishable over Easton. Therefore, it is respectfully requested that the rejection of these claims under Section 102(b) be withdrawn.

Claims 31-32, 35-42, 44-47, 49-50, 52, 56, 59-61, 63-65, 67-68, and 70-71 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Easton in view of Shohara (US Publication 2003/0087617). This rejection is respectfully traversed.

Claims 59-61 and 63-65 have been canceled without prejudice or disclaimer. Accordingly, the rejection of these claims has been rendered moot. The following remarks address the rejection of the remaining claims 31-32, 35-42, 44-47, 49-50, 52, 56, 67-68, and 70-71.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the

reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

The Office has failed to make out a *prima facie* case of obviousness at least because the Easton and Shohara references, even if combined, fail to disclose the use of different prerotation frequencies being applied on the different rays. In independent claim 31, this is recited as “frequency error correctors for correcting frequency errors on each of the despread value streams by, for each of the despread value streams, progressively rotating the phase angle of successive despread values at a rate given by an associated frequency error integral” (Emphasis added.) In independent claim 41, this is recited as “correcting frequency errors on each of the despread value streams by, for each of the despread value streams, progressively rotating the phase angle of successive despread values at a rate given by an associated frequency error integral” (Emphasis added.) That is, each of the despread value streams has its own “associated” frequency error integral that controls the rate of phase angle rotation.

Thus, in accordance with embodiments defined by independent claims 31 and 41, one set of despread values (path 1) could, merely for example, have a 50 Hz correction applied to it, while another set of despread values (path 2) has a 100 Hz correction applied.

In its rejection, the Office has focused on the Shohara reference disclosing a prerotation approach to correcting data. However, even if Easton and Shohara are considered in combination, at best there might be a teaching of applying a single correction to all despread values – nothing in either of these documents would suggest using different frequency error integrals for different rays, as required by Applicants' claims.

For at least the foregoing reasons, independent claims 31 and 41, as well as the claims 32, 35-40, 42, 44-47, 49-50, 52, 56, 67-68, and 70-71 are believed to be patentably distinguishable over the Easton and Shohara references, regardless of whether these references are considered individually or in combination. Therefore, it is respectfully requested that the rejection of these claims under Section 103(a) be withdrawn.

New claims 77-80 have been added to the application without introduction of new matter. These dependent claims are believed to be patentable at least because they each depend from a base claim that requires that a frequency error be estimated separately for each base station / transmitter whose signal is received. Each of claims 77-80 further requires that at least one of the base station / transceiver frequency error estimates is formed using two or more fingers of a RAKE receiver. Support for these amendments may be found, for example,

in the exemplary embodiment depicted in FIG. 15A, in which two summers 504-1, 504-2 generate estimates for base stations 1 and 2, respectively, and for each of the summer 504-1, 504-2, the possibility is shown of using the outputs from two or more fingers of a RAKE receiver.

The application is believed to be in condition for allowance. Prompt notice of same is respectfully requested.

Respectfully submitted,
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Application Title: Method and Apparatus for Automatic Frequency

control in a CDMA Receiver

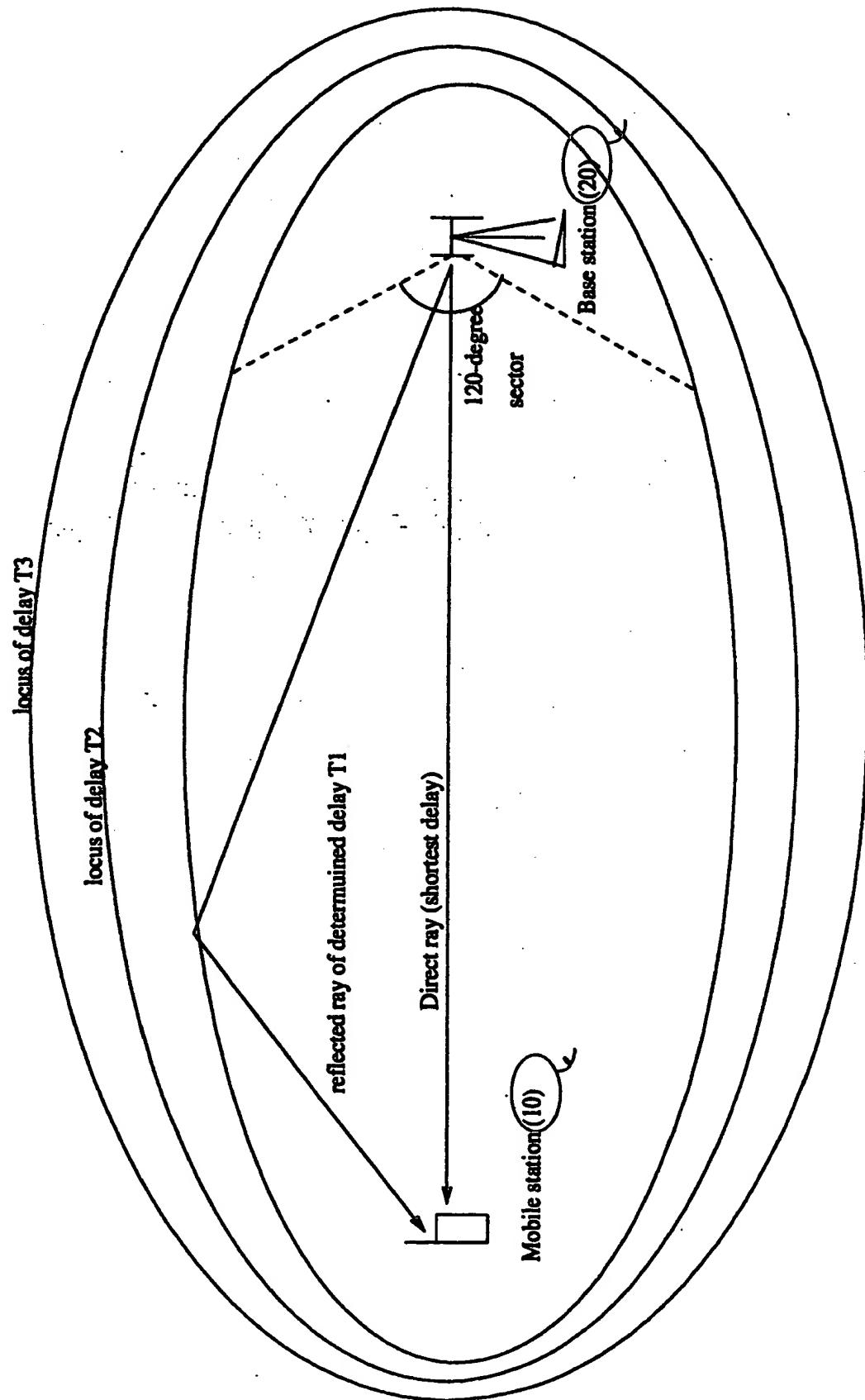
Application Number: 09/678,907

Application Filing Date: October 4, 2000

Inventor: Roozbeh ATARIUS et al. Annotated Marked-up Drawing



FIG. 3



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control in a CDMA Receiver

Application Number: 09/678,907

Application Filing Date: October 4, 2000

Inventor: Roozbeh ATARIUS et al. Annotated Marked-up Drawing



FIG. 6

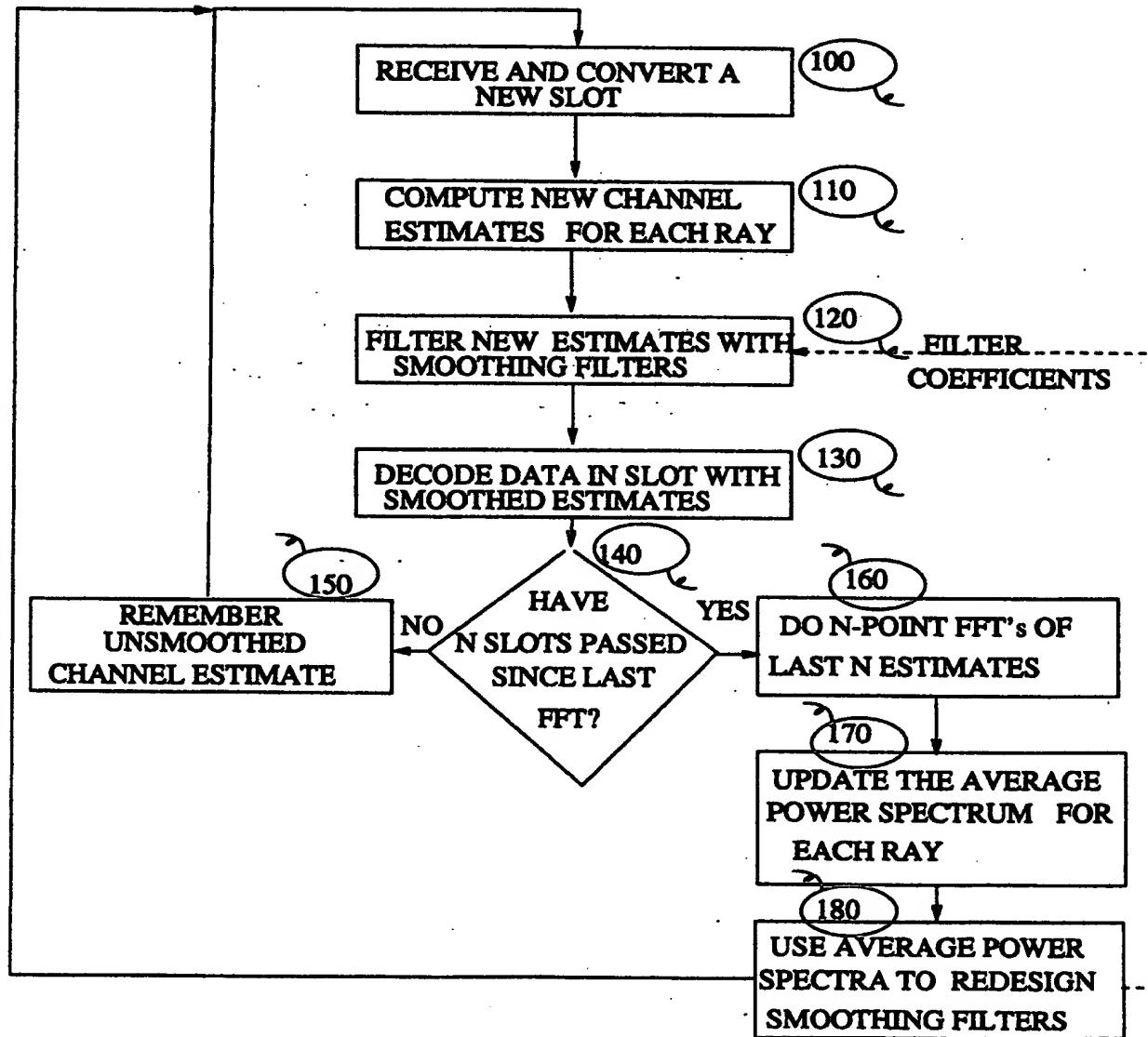
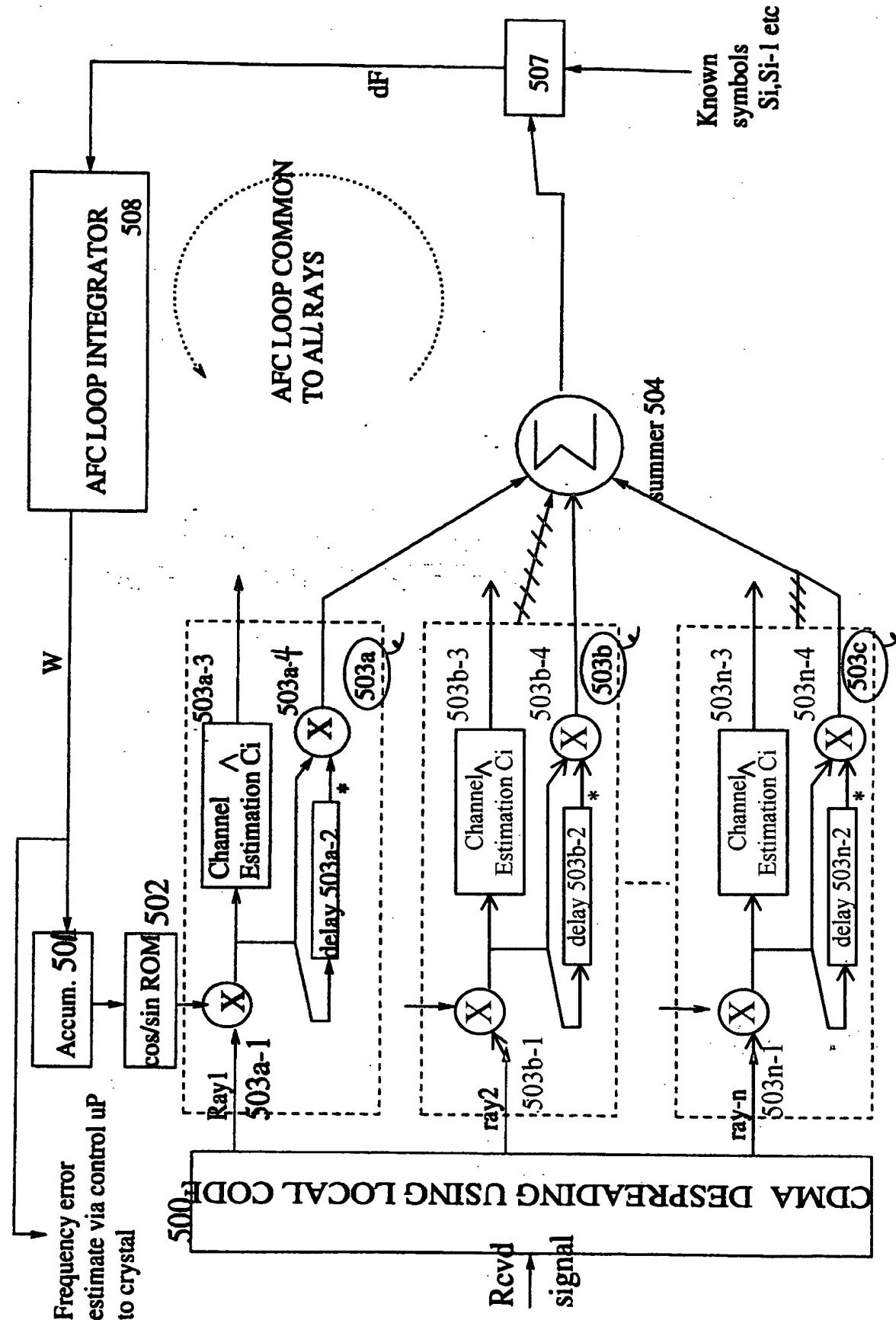




FIG. 10



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Application Filing Date: October 4, 2000

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FIGURE 15A: FREQUENCY ERROR ESTIMATION FOR TWO BASE STATIONS

